

=====

Sequence Listing was accepted.

See attached Validation Report.

If you need help call the Patent Electronic Business Center at (866)  
217-9197 (toll free).

Reviewer: Anne Corrigan

Timestamp: [year=2009; month=11; day=25; hr=11; min=14; sec=7; ms=427; ]

=====

Application No: 10598965 Version No: 4.0

**Input Set:****Output Set:**

**Started:** 2009-11-24 16:47:07.748  
**Finished:** 2009-11-24 16:47:10.456  
**Elapsed:** 0 hr(s) 0 min(s) 2 sec(s) 708 ms  
**Total Warnings:** 31  
**Total Errors:** 1  
**No. of SeqIDs Defined:** 32  
**Actual SeqID Count:** 32

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (2)
W 213	Artificial or Unknown found in <213> in SEQ ID (3)
W 213	Artificial or Unknown found in <213> in SEQ ID (4)
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (6)
W 213	Artificial or Unknown found in <213> in SEQ ID (7)
W 213	Artificial or Unknown found in <213> in SEQ ID (8)
W 213	Artificial or Unknown found in <213> in SEQ ID (9)
W 213	Artificial or Unknown found in <213> in SEQ ID (10)
W 213	Artificial or Unknown found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (18)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)
W 213	Artificial or Unknown found in <213> in SEQ ID (20)
W 213	Artificial or Unknown found in <213> in SEQ ID (21)

**Input Set:**

**Output Set:**

**Started:** 2009-11-24 16:47:07.748  
**Finished:** 2009-11-24 16:47:10.456  
**Elapsed:** 0 hr(s) 0 min(s) 2 sec(s) 708 ms  
**Total Warnings:** 31  
**Total Errors:** 1  
**No. of SeqIDs Defined:** 32  
**Actual SeqID Count:** 32

Error code	Error Description
	This error has occurred more than 20 times, will not be displayed
E 257	Invalid sequence data feature in <221> in SEQ ID (32)

# SEQUENCE LISTING

<110> GARIEPY, JEAN  
WEI, XIN

<120> LIBRARY OF TOXIN MUTANTS, AND METHODS OF USING SAME

<130> 107415-0003-101

<140> 10598965

<141> 2009-11-24

<150> PCT/CA2004/000443

<151> 2004-03-26

<160> 32

<170> PatentIn version 3.5

<210> 1

<211> 299

<212> PRT

<213> Escherichia coli

<400> 1

Ile	Glu	Gly	Arg	Ala	Ser	Lys	Glu	Phe	Thr	Leu	Asp	Phe	Ser	Thr	Ala
1				5					10					15	

Lys	Thr	Tyr	Val	Asp	Ser	Leu	Asn	Val	Ile	Arg	Ser	Ala	Ile	Gly	Thr
			20					25					30		

Pro	Leu	Gln	Thr	Ile	Ser	Ser	Gly	Gly	Thr	Ser	Leu	Leu	Met	Ile	Asp
		35					40					45			

Ser	Gly	Ser	Gly	Asp	Asn	Leu	Phe	Ala	Val	Asp	Val	Arg	Gly	Ile	Asp
	50					55					60				

Pro	Glu	Glu	Gly	Arg	Phe	Asn	Asn	Leu	Arg	Leu	Ile	Val	Glu	Arg	Asn
65					70					75					80

Asn	Leu	Tyr	Val	Thr	Gly	Phe	Val	Asn	Arg	Thr	Asn	Asn	Val	Phe	Tyr
				85					90					95	

Arg	Phe	Ala	Asp	Phe	Ser	His	Val	Thr	Phe	Pro	Gly	Thr	Thr	Ala	Val
			100						105					110	

Thr	Leu	Ser	Gly	Asp	Ser	Ser	Tyr	Thr	Thr	Leu	Gln	Arg	Val	Ala	Gly
			115				120					125			

Ile Ser Arg Thr Gly Met Gln Ile Asn Arg His Ser Leu Thr Thr Ser  
130 135 140

Tyr Leu Asp Leu Met Ser His Ser Gly Thr Ser Leu Thr Gln Ser Val  
145 150 155 160

Ala Arg Ala Met Leu Arg Phe Val Thr Val Thr Ala Glu Ala Leu Arg  
165 170 175

Phe Arg Gln Ile Gln Arg Gly Phe Arg Thr Thr Leu Asp Asp Leu Ser  
180 185 190

Gly Arg Ser Tyr Val Met Thr Ala Glu Asp Val Asp Leu Thr Leu Asn  
195 200 205

Trp Gly Arg Leu Ser Ser Val Leu Pro Asp Tyr His Gly Gln Asp Ser  
210 215 220

Val Arg Val Gly Arg Ile Ser Phe Gly Ser Ile Asn Ala Ile Leu Gly  
225 230 235 240

Ser Val Ala Leu Ile Leu Asn Cys His His His Ala Ser Arg Val Ala  
245 250 255

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys Pro Ala Asp Gly Arg  
260 265 270

Val Arg Gly Ile Thr His Asn Lys Ile Leu Trp Asp Ser Ser Thr Leu  
275 280 285

Gly Ala Ile Leu Met Arg Arg Thr Ile Ser Ser  
290 295

<210> 2

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
primer

<400> 2

gttactgtga cagctgaagc ttacgtttt cg

<210> 3  
<211> 31  
<212> DNA  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic  
primer

<400> 3  
gagaagaaga gactgcagat tccatctggt g 31

<210> 4  
<211> 302  
<212> PRT  
<213> Artificial Sequence  
  
<220>  
<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 4  
Lys Gly Met Arg Ser His His His His His His His His Ile Glu Gly  
1 5 10 15  
  
Arg Ala Ser Lys Glu Phe Thr Leu Asp Phe Ser Thr Ala Lys Thr Tyr  
20 25 30  
  
Val Asp Ser Leu Asn Val Ile Arg Ser Ala Ile Gly Thr Pro Leu Gln  
35 40 45  
  
Thr Ile Ser Ser Gly Gly Thr Ser Leu Leu Met Ile Asp Ser Gly Ser  
50 55 60  
  
Gly Asp Asn Leu Phe Ala Val Asp Val Arg Gly Ile Asp Pro Glu Glu  
65 70 75 80  
  
Gly Arg Phe Asn Asn Leu Arg Leu Ile Val Glu Arg Asn Asn Leu Tyr  
85 90 95  
  
Val Thr Gly Phe Val Asn Arg Thr Asn Asn Val Phe Tyr Arg Phe Ala  
100 105 110  
  
Asp Phe Ser His Val Thr Phe Pro Gly Thr Thr Ala Val Thr Leu Ser  
115 120 125  
  
Gly Asp Ser Ser Tyr Thr Thr Leu Gln Arg Val Ala Gly Ile Ser Arg



Arg Ala Ser Lys Glu Phe Thr Leu Asp Phe Ser Thr Ala Lys Thr Tyr  
20 25 30

Val Asp Ser Leu Asn Val Ile Arg Ser Ala Ile Gly Thr Pro Leu Gln  
35 40 45

Thr Ile Ser Ser Gly Gly Thr Ser Leu Leu Met Ile Asp Ser Gly Ser  
50 55 60

Gly Asp Asn Leu Phe Ala Val Asp Val Arg Gly Ile Asp Pro Glu Glu  
65 70 75 80

Gly Arg Phe Asn Asn Leu Arg Leu Ile Val Glu Arg Asn Asn Leu Tyr  
85 90 95

Val Thr Gly Phe Val Asn Arg Thr Asn Asn Val Phe Tyr Arg Phe Ala  
100 105 110

Asp Phe Ser His Val Thr Phe Pro Gly Thr Thr Ala Val Thr Leu Ser  
115 120 125

Gly Asp Ser Ser Tyr Thr Thr Leu Gln Arg Val Ala Gly Ile Ser Arg  
130 135 140

Thr Gly Met Gln Ile Asn Arg His Ser Leu Thr Thr Ser Tyr Leu Asp  
145 150 155 160

Leu Met Ser His Ser Gly Thr Ser Leu Thr Gln Ser Val Ala Arg Ala  
165 170 175

Met Leu Arg Phe Val Thr Val Thr Ala Glu Ala Leu Arg Phe Arg Gln  
180 185 190

Ile Gln Arg Gly Phe Arg Thr Thr Leu Asp Asp Leu Ser Gly Arg Ser  
195 200 205

Tyr Val Met Thr Ala Glu Asp Val Asp Leu Thr Leu Asn Trp Gly Arg  
210 215 220

Leu Ser Ser Val Leu Pro Asp Tyr His Gly Gln Asp Ser Val Arg Val  
225 230 235 240

Gly Arg Ile Ser Phe Gly Ser Ile Asn Ala Ile Leu Gly Ser Val Ala



245	250	255
Leu Ile Leu Asn Cys His His His	Ala Ala Phe Ala Asp Leu Ile Ala	
260	265	270
Ser Arg Val Ala Arg Met Ala Ser	Asp Glu Phe Pro Ser Met Cys Pro	
275	280	285
Ala Asp Gly Arg Val Arg Gly Ile Thr	His Asn Lys Ile Leu Trp Asp	
290	295	300
Ser Ser Thr Leu Gly Ala Ile Leu Met	Arg Arg Thr Ile Ser Ser	
305	310	315

<210> 6  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6  
Ile Tyr Ser Asn Lys Leu Met  
1 5

<210> 7  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7  
Ala Ala Phe Ala Asp Leu Ile  
1 5

<210> 8  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8

Pro Asp Thr Arg Pro Ala Pro  
1 5

<210> 9  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
6xHis tag

<400> 9  
His His His His His His  
1 5

<210> 10  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 10  
ccagacacgc gaccagctcc a 21

<210> 11  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 11  
ccagacggga tcggggctcc a 21

<210> 12  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 12  
ccagacctgg agatggctcc a 21

<210> 13  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 13  
ccagaccccc gtggggctcc a 21

<210> 14  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 14  
ccagacgacg acttggctcc a 21

<210> 15  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 15  
ccagacgtcc ggtgggctcc a 21

<210> 16  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 16  
ccagaccagc gctgggctcc a 21

<210> 17  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 17  
ccagacctca ggatggctcc a 21

<210> 18  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 18  
ccagactccc aggaggctcc a 21

<210> 19  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 19  
ccagactccg accccgctcc a 21

<210> 20  
<211> 21  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 20  
ccagacacgc gccccgctcc a 21

<210> 21  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 21

Cys His His His Pro Asp Thr Arg Pro Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 22  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 22  
Cys His His His Pro Asp Gly Ile Gly Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 23  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 23  
Cys His His His Pro Asp Leu Gln Met Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 24  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 24  
Cys His His His Pro Asp Pro Arg Gly Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 25  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 25  
Cys His His His Pro Asp Asp Asp Leu Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 26  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 26  
Cys His His His Pro Asp Val Arg Trp Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 27  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 27  
Cys His His His Pro Asp Gln Arg Leu Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 28  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 28  
Cys His His His Pro Asp Leu Arg Met Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 29  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 29  
Cys His His His Pro Asp Ser Gln Glu Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 30  
<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 30  
Cys His His His Pro Asp Ser Asp Pro Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 31

<211> 27  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 31  
Cys His His His Pro Asp Thr Arg Pro Ala Pro Ala Ser Arg Val Ala  
1 5 10 15

Arg Met Ala Ser Asp Glu Phe Pro Ser Met Cys  
20 25

<210> 32  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<220>  
<221> MOD\_RES  
<222> (3)..(5)  
<223> Any amino acid

<400> 32  
Pro Asp Xaa Xaa Xaa Ala Pro  
1 5